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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,174	11/14/2003	Atsuhiro Sakurai	TI-35272	2911

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EXAMINER	
SAINT CYR, LEONARD	
ART UNIT	PAPER NUMBER
2626	

NOTIFICATION DATE	DELIVERY MODE
12/27/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com

Office Action Summary	Application No.	Applicant(s)	
	10/714,174	SAKURAI ET AL.	
	Examiner	Art Unit	
	LEONARD SAINT CYR	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5,6,8 and 10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,and 6* is/are rejected.

7)☒ Claim(s) *3,5,8 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11/14/03* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 10/11/10 have been fully considered but they are not persuasive.

Applicants argue that neither Laroche (1999) nor Laroche (300) nor Dolson teach calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm (Amendment, pages 6 – 8).

The examiner disagrees, since Dolson discloses "at step 210, signal processing system 100 **computes a desired DFT phase modification but preferably only for each significant peak in each DFT representation rather than for every channel**. For the time scaling application, this DFT phase modification is preferably computed using the formula developed by Portnoff: .phi.(k,m)=.phi.(k,m-1)+.alpha.[.phi.(k,m)-.phi.(k,m-1)], where .alpha. is the time compression or expansion factor. At step 212, signal processing system 100 **computes the remaining phase values in each contiguous frequency regions.** These are determined so as to preserve the original relationship between phase values, despite the change in the phase value of the significant peak. In one embodiment, **the phase values are simply shifted by adding or subtracting the same number that was added to or subtracted from the phase value for the significant peak** (two different ways of computing phase values; col.5, lines 33 – 60; see also fig.2).

2. Applicant's arguments, see pages 8 - 10, filed 10/11/10, with respect to claims 3, 5, 8, and 10 have been fully considered and are persuasive. The rejection of claims 3, 5, 8, and 10 has been withdrawn.

Applicants argue that neither Laroche (1999) nor Laroche (300) nor Dolson teach merging nearby spectral lines that are within a predetermined frequency range of each other prior to calculating the phase difference; partitioning the spectrum into a plurality of contiguous spectral bands includes adjusting boundaries of spectral bands to maintain important frequency groups within the same spectral band (Amendment, pages 8 - 10).

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laroche (Improved Phase Vocoder Time-Scale modification of Audio, IEEE, 1999) in view of Laroche (US Patent 6, 766,300); and further in view Dolson (US Patent 6,112,169).

As per claims 1, and 6, Laroche (1999) discloses a method/apparatus of converting an input digital audio signal into an output digital audio signal having a modified time scale comprising the steps of:

receiving input digital audio data having a first time scale ("time scale…in the audio and speech"; page 323, col.1, paragraph 2)

calculating a discrete Fourier transform of first equally spaced, overlapping time windows having a first overlap amount of the input digital audio signal ("N is the size of the discrete Fourier transform...correspond to overlapping"; page 324, col.1, section A – col.2, paragraph 1);

partitioning the spectrum into a plurality of contiguous spectral bands ("the windowed short-time signals"; page 324, col.1, section A – col.2, paragraph 1);

identifying a dominant spectral line having the greatest magnitude within each spectral band ("searched local maxima…dominant peak"; page 329, col.1, paragraphs 2, and 3);

calculating a phase difference for the dominant spectral line of each spectral band by a phase vocoder algorithm ("**phase difference**"; page 329, col.1, paragraph 3; page 330, col.1, last 15 lines);

calculating a phase difference for each of a predetermined number of spectral lines near the dominant spectral line within each spectral band as the phase difference of the corresponding dominant spectral line ("**calculate analysis phase difference between peak and current channel, and calculate current synthesis phase using (16)"** ; see also the steps of the scaled-phase-locking scheme summary; page 329, col.1, paragraph 3; page 330, col.1, last 15 lines); and

calculating an inverse discrete Fourier transform resulting in equally spaced, overlapping time windows having a second overlap amount employing the calculated phase difference for each spectral line, the second overlap selected having a ratio to the first overlap amount to achieve a desired time scale modification ("**resynthesis**

stage…obtained by inverse-Fourier-transform…satisfy strong consistency conditions…correspond to overlapping short-time signals"; page 324, col.1, section A, paragraph 2 –col.2, paragraph 1);

converting the digital audio signal into an audio signal having a second time scale according to the desired time scale modification ("pitched signals such as speech…performing time-scale modification"; page 331, col.2, paragraph 1).

However, Laroche (1999) does not specifically teach calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm; partitioning the spectrum into a plurality of contiguous spectral bands according to a Bark scale where each spectral band has an extent dependent upon human frequency perception.

Laroche (300) teaches that the duration of the window size and the size of the Fourier transform are usually set to 3 to 5 ms, which gives uniform frequency bands of about 300 Hz; a better sub-band decomposition could be used using frequency bands uniform in a bark scale (col.3, lines 51 - 58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to used bark scale frequency division as taught by Laroche (300) in Laroche (1999), because that would help better divide the spectrum in better uniform frequency bands (col.3, lines 53 – 55).

However, Laroche (1999) in view of Laroche (300) do not specifically teach calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm.

Dolson teaches computing the remaining phase values in each contiguous frequency regions. The phase values are simply shifted by adding or subtracting the same number that was added to or subtracted from the phase value for the significant peak (col.5, lines 50 – 60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to shift the remaining phase values as taught by Dolson in Laroche (1999) in view of Laroche (300), because that would preserve the linear differences among the phases (col.5, lines 57 -60).

Allowable Subject Matter

5. Claims 3, 5, 8, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

As to claims 3, and 8, neither Laroche (1999) nor Laroche (300) nor Dolson teach merging nearby spectral lines that are within a predetermined frequency range of each other prior to calculating the phase difference.

As to claims 6, and 10, neither Laroche (1999) nor Laroche (300) nor Dolson teach partitioning the spectrum into a plurality of contiguous spectral bands includes adjusting boundaries of spectral bands to maintain important frequency groups within the same spectral band.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD SAINT CYR whose telephone number is (571)272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or (571)-272-1000.

LS

12/15/10

/Leonard Saint-Cyr/

Examiner, Art Unit 2626